

REMARKS

Applicants respectfully request reconsideration of the rejections set forth in the Office Action mailed on January 14, 2003. Claim 52 has been added herein. Claims 40-43, 45, 51, and 52 are pending. All claims have been rejected.

This amendment is to expedite prosecution and should not be construed as acquiescence in any ground of rejection. Applicants reserve the right to prosecute the originally filed claims in the future.

Applicants believe this amendment complies with the revised amendment format that is an expansion of the special amendment process instituted for a prototype Electronic File Wrapper program described in USPTO ANNOUNCES PROTOTYPE OF IMAGE PROCESSING, 1265 Off. Gaz. Pat. Office 87 (Dec. 17, 2002).

The sole rejection pending is a rejection of all claims under 35 U.S.C. §112, first paragraph for lack of enablement. Specifically, the Examiner maintains that the specification lacks guidance, direction and examples for deriving the morphological values and/or their degrees of presence. Applicants respectfully traverse this rejection. •

In response, Applicants first submit that the Office is applying an incorrect standard in evaluating whether undue experimentation is required. The standard that appears to be articulated in the Office Action is that undue experimentation is required unless one skilled in the art can *predict* a priori with reasonable success which morphological values will be of interest or how to calculate such values. This standard suggests that the underlying concern is that considerable experimentation will be required to identify the morphological values. The law is clear, however, that one cannot equate considerable experimentation with undue experimentation. As stated in *In re Wands*, 8 USPQ2d 1400, 858 F.2d 731, 737 (Fed. Cir. 1988):

[E]xperimentation needed to practice the invention must not be undue experimentation. The key word is 'undue,' not 'experimentation.' The determination of what constitutes undue experimentation in a given case requires the application of a standard of reasonableness, having due regard for the nature of the invention and the state of the art...*The test is not merely quantitative, since a considerable amount of experimentation is permissible, if it is merely routine, or if the specification in question*

provides a reasonable amount of guidance with respect to the direction in which the experimentation should proceed. (emphasis added).

The appropriate test in this application is whether morphological values derived from techniques not explicitly stated in the specification can be implemented in the claimed invention based on the guidance provided in the specification. The appropriate test is not whether a skilled practitioner can *predict* which morphological values should be derived. Applying the correct test, Applicants submit that the application satisfies the enablement requirements.

First, morphological values can be identified and derived without undue experimentation because manual methods for determining cellular morphology and for image analysis were routine as of the filing date of the application.

As pointed out in Applicants's previous responses and in the Specification, at for example, page 5, the present invention provides *computer software* for mapping a manipulation of cells based upon a morphological characteristic. Figures 4 and 5 depict various morphologies (such as apoptotic, abnormal mitotic, normal interphase, and normal mitotic) in a cell population responsive to drug concentration. These cellular morphologies or attributes are reflected by the corresponding morphological value and associated degree of presence. Morphological values or parameter, as claimed herein, can be a cell count, an area, a perimeter, a length, a breadth, a fiber length, a fiber breadth, a shape factor, an elliptical form factor, an inner radius, an outer radius, a mean radius, an equivalent radius, an equivalent sphere volume, an equivalent prolate volume, an equivalent oblate volume, an equivalent sphere surface area, an average gray value, a total gray value, and an optical density. The associated degree of presence is the mathematical value of the morphological parameter. For example, the morphological value may be area of between 6000 and 19,000 (see, Specification at page 30). The associated degree of presence for this morphological parameter would be 917, i.e., there were 917 objects that had an area between 6000 and 19,000.

In addition, these morphological values can be mathematically combined. For example, the Specification at page 30 provides an example of the combining of area and average gray value. Thus, the morphological values would be area of between 6000 and 19,000 and an average gray value of >60. The associated degree of presence would be 116 (i.e., 116 of the objects being analyzed had an average gray value of >60 and an area of between 6000 and 19,000). A scatter plot of area versus average gray value was also produced. In addition, the Specification at pages 36-45 provides pseudocode for the commercial program AnalyseDNA.m

program which can be used to capture and manipulate various morphological values.

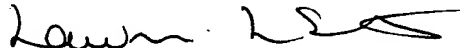
While the process of manipulating the cells, imaging the cells, and analyzing the images may have required considerable experimentation, such experimentation would not be "undue" because the methods were routine. This is all that the law requires.

Finally, with regard to computer software, as claimed herein, the Federal Circuit held in *Fonar v. General Electric*, 107 F.3d 1543 (CAFC 1997), that source code and flow charts are not required where the software functions are disclosed sufficiently. The standard by which this objective measurement is applied is one skilled in the art of *programming*. Thus, the "guidance" required for the present invention is not measured against one skilled in the art of cellular biology as submitted by the Examiner, but rather, against one skilled in the art of programming.

Applicants believe that a programmer skilled in the art could readily create code to capture morphological values, assign their associated degrees of presence, produce a statistical profile by combining these values, and map the effect of the manipulation based upon the statistical profile. Applicants respectfully submit that the claims are enabled under the standard enumerated under *Fonar* and *Wands*, and request withdrawal of this rejection.

Applicants believe that the claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
BEYER WEAVER & THOMAS, LLP



Lauren L. Stevens
Reg No. 36,691

P.O. Box 778
Berkeley, CA 94704
(650) 961-8300